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Due to rapid industrial and technological developments, evaluation of vocational education programs must be a continuous process. The product to be evaluated is an educated youth capable not only of entry into the labor market, but also of persisting and progressing in the occupation. Capsulated descriptions of evaluation research on vocational education programs are presented in: (1) Retraining Projects, (2) Agricultural Education, (3) Business Education, (4) Industrial Arts and Trade and Industrial Education, (5) Vocational Guidance, (6) Adult Education, (7) Teaching Methods, (8) Teaching Machines and Program Instruction, and (9) General Curriculum, are presented. The document also contains a comprehensive bibliography of books, dissertations, journals, bulletins and research reports. (FP)

RCU

RESEARCH SUMMARIES

RESEARCH COORDINATING UNIT

•Vocational Education Section•

Evaluation in Vocational Education

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RCU | RESEARCH SUMMARY

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Evaluation in Vocational Education.

Prepared by

Research Coordinating Unit
for Vocational Education

DIVISION OF INSTRUCTION

PREFACE

Evaluation is an important aspect of the industrial world. Quality control must be maintained throughout all operations in the manufacture of a product. Mass production requires interchangeability of parts. After the product is ready for distribution, the final evaluation is public acceptance. If the product is not purchased changes must be made in display, advertising, or in the basic design or manufacture of the product.

Evaluation is equally important in the field of education, and due to rapid industrial and technological developments, evaluation of vocational education programs must be a continuous process. The product to be evaluated is an educated youth not only capable of entry into the labor market but one who is capable of persisting and progressing in the occupation.

Educators are preparing a very valuable product -- an educated young adult. Placement of the vocational graduate and success on the job are indicators of the effectiveness of the vocational education program. Maximum program support may be expected when the employer receives a satisfactory product. Evaluation is necessary in providing that product.

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EVALUATION

Introduction

Evaluation is the process of assessing the extent and direction of change resulting from an experimental situation. Evaluation helps identify the strengths and weaknesses of a research project, and thus leads to the development of plans of action by which weaknesses discovered may be corrected.

Retraining Projects

In 1963, more than 65,000 individuals were enrolled under the provisions of the Manpower Development and Training Act, (Secretary of Labor, 1964c). During the year, 27,500 persons completed training; of this number about 73 percent were placed in jobs.

The Department of Labor (1964b), in a comparative statistical study of training programs throughout the country, found that appreciably greater proportions of women (41 percent), youth (33 percent) and nonwhites (28 percent) were enrolled in 1964 than were enrolled in 1963. More trainee graduates (74 percent) were employed in 1964 than in 1963 (70 percent). Participation of older workers continued to lag, and one of the most serious obstacles to qualifying for training under MDTA was lack of education.

Gursslin and Roach (1964) attempted to determine if the unemployed lack ability as it is currently conceived. Of those completing training and obtaining employment, 60.4 percent had a 12th grade education or greater; 37.1 percent had less than a 12th grade education. Training programs can be calibrated to train a minority of persons for highly skilled occupations, or they conform to the general background level of most of the unemployed and train them for occupations already over-supplied. Those conducting this study believed that lower status persons with impaired intellectual functioning, deficient conceptual skill and inadequate verbal skill have no place in automation-type jobs.

The Department of Labor (1964d) evaluated the extent to which training programs under the "Manpower Development and Training Act of 1962",were meeting the needs of women. It was found that such programs were contributing to the occupational mobility of women, who comprise one-third of the nation's workforce and two-fifths of its unemployed. Women receiving training for nursing, nurse's aide, and other occupations in the professional, technical, semi-professional, and service categories had a high employment rate (74 percent). The placement record for women over 45 was 74 percent.

The Department of Labor (1966c) reported on employment trends and the status of service jobs. Enrollees in service training projects constituted 30 percent of all MDTA enrollees through May, 1964. As of 1964, service occupations provided work for 11 million. Almost half the service workers were employed in industries that provide personal, professional, and business services.

In a study of sixteen metropolitan areas of various sizes, the Department of Labor (1966a) found that it was feasible and practical to collect job information by detailed occupation. Eighty percent of the employers surveyed were able and willing to supply this type of data. Twenty-five percent of the respondents reported at least one person was registered for work in the public employment service file for every job vacancy. Vacancies were heavily concentrated in a few occupations: nurses accounted for one-fourth of all professional vacancies, and sales persons and sales clerks accounted for two-thirds of the vacancies in merchandising. One-half of the job vacancies in service occupations were for waiters or waitresses.

In a report of youth training projects in East Los Angeles made by the Department of Labor, (1964a), it was found that of the youths served, 60 to 70 percent were deficient in reading, 60 percent had police records, 40 percent used some form of drugs, and 10 percent were addicted. It was found that in this area, there existed institutional overlapping, staff inexperience, uncertainties of inter-governmental relationships, and lack of satisfactory organizational methods. The use of intensive two-day group intake counseling techniques was credited with attracting and motivating a disadvantaged Mexican-American group. Seven hundred and twenty applicants were served; there was a 12 percent dropout rate; 165 were placed; 59 completed a clerk-typist program; and 124 applicants found jobs for themselves. It was felt that the program was affected by the local political "power" structure.

In a study made by Brazziel (1964) in the Norfolk-Portsmouth area, 90 men who accepted training were compared to 224 men who rejected training. Those who rejected the training were convinced that they could not support their families on the weekly training allowance of $25 during a year's retraining. Their attitudes were also characteristic of those who enrolled. In most other respects, including education and economic status, the two groups were similar. However, those who rejected training were less likely to have acquired some sophistication toward employment opportunities as a result of military training or work outside the Norfolk-Portsmouth area. Both groups thought retraining would be harder for older men and both groups were hesitant about relocating. Most of both groups were Negroes. Those who rejected training did not lack ambition or initiative and did not anticipate a great difficulty in finding a job in the area, if they had new skills. They also mentioned better job placement services, more on-the-job training by industry and new public works programs.

It has been found that the Area Redevelopment Act (ARA) made possible the training or retraining of some 15,000 unemployed workers (Levitan, 1964). Seventy percent of the ARA graduates succeeded in finding jobs. One project involving the California vocational education authorities, the U. S. Department of Labor, and the Bureau of Indian Affairs moved 35 Indians from eight reservations to Los Angeles for training in soldering and wiring. The RCA Institute supplied the training. Thirty completed the training and 29 obtained jobs. One returned to his reservation.

Of 225 unemployed Oklahoma workers receiving farm mechanics training under the Area Redevelopment Act, 78 percent succeeded in obtaining jobs (Kunty, 1964). Of those employed, 60 percent found jobs related to their training. Three tests -- general intelligence, spatial aptitude, and finger dexterity -- were used in the selection of trainees. The spatial aptitude test was the best single predictor of success as farm mechanics. The investigator believed that the spatial aptitude test should be given more emphasis than the general intelligence or finger dexterity test.

A majority of the unsuccessful job-seekers who completed training were single or divorced.

The national dropout figure for MDTA projects has been placed at fifty percent; the percent of dropouts from MDTA projects at the Modesto Junior College in California was 16 percent (MDTA, 1966d). The rate for dropouts in programs over which the school had some control was found to be nine percent. The actual dropout rate for vocational projects was eight percent and for pre-vocational projects it was 12 percent. At Modesto Junior College, MDTA trainees completing training have an employment rate of 84 percent.

Modesto Junior College has had over 800 trainees under the Manpower Development and Training Act (Pearce, 1966a). Of these trainees, 86 percent have gone to work. The dropout rate was 11 percent for the multi-occupational project, including about 25 courses, as compared with a 50 percent completion rate for the state. The investigator proposed a comprehensive evaluation of all aspects of this multi-occupational adult retraining program. Its purpose, as an element of MDTA, is to provide a model for future programs and a basis for continually improving the current program.

An evaluative study was made of the testing program used in connection with the Manpower Development and Training Act training program at the Modesto Junior College (MDTA, 1966a). Results obtained from the California Achievement Test suggested that more emphasis in the program should be given to the development of vocabulary and reading skills. It was recommended that test administration become the responsibility of one or two persons and that test groups be limited to 20 or 25 persons. It was recommended that the Modesto project develop norms and use a standard score such as the "Z" score. It was further suggested that invididuals be tested three weeks after entering the program and every three months thereafter. The procedures used to inform the students of the purpose of the test should be improved. It was felt that an effort should be made to alleviate any feelings of threat and anxiety students might have concerning testing by removing any time limit that might be placed on the tests.

A 300-hour training program was given at Modesto Junior College for the training of bank tellers (MDTA, 1966b). It was suggested that the class was successful, and trainees seemed to acquire confidence as the course progressed. Of the 17 class members, seven were hired in related jobs. At the time of completion, eight were not employed, and one had left the labor market.

Seventy-four persons enrolled in five classes completed a 360-hour custodial training program at Modesto Junior College (MDTA, 1966c). Approximately 74 percent of the trainees were employed when a follow-up was made six months after the completion of the course. Teaching methods utilized the three step process of (1) tell, (2) show and (3) do, with major emphasis on the latter step -- that is, on practice.

Of 121 persons in eight classes completing the nurse's aide training course at Modesto Junior College under the Manpower Development and Training Act (MDTA, 1966e), 53 percent have been employed in that field. The relatively high success in this program can be attributed to (1) a demand for nurse's aides that exceeded supply in the area, (2) excellent cooperation between staff members of the training program and institutions seeking nurse's aides, and (3) an instructor who apparently was highly efficient and well qualified.

In the general research findings of a Modesto Junior College (MDTA, 1966d) follow-up survey of those who had participated in the training program it was indicated that:

1. Fifty-one percent were employed when the survey was conducted.

2. Eighty-five percent had been employed at one time or another following training.

3. Thirteen percent were unemployed.

4. Nine percent could not be located.

5. Three-fourths of the adults were employed fulltime.

6. Eighty percent of those employed indicated that their training had assisted them in procuring a job.

Since September, 1963, none of the business education classes under the MDTA programs has provided either basic or refresher training in stenography and general office subjects. Of a total of 169 trainees graduated, 103 have obtained employment within the occupational fields of employment in which they received training.

Agricultural Education

Several investigators have made follow-up studies of the occupational status of former students of vocational agriculture. The results of their investigation are indicated in the table shown on page 7. It should be remembered that in each investigation the location of former students varied. There was also variation in the number of years since former students had taken courses in vocational agriculture; differences in occupational classification were also used.

Occupational Experiences of Former Vocational Agriculture Students

	Investigator and State						
	Hayles Louisiana	Stenholm Texas	Eggenberger Texas	Farrer Utah	Williams Arizona	Edington & Hill Oklahoma ***	Campbell Virginia
	% of Graduates in Different Fields of Work						
Production Agriculture	16.5	9.5	28.4	39.4	18	18.2	62
Agriculture Related *	13.8	3.4	15.7	12.3	6	23.2	
Agriculture Unrelated	69.7	87.1	59.5	46.3	3.5	32.9	38
Military (temporary)			6.4		14	16.4	
Higher Education					27 **	17.9	
Unemployed						3.2	
Deceased						.5	

* Some investigators included students in agricultural colleges.

** Approximately 51 percent plan to go to production agriculture or related jobs after completing their higher education.

*** Total is more than 100 percent because of duplicate classification.

Interviews were conducted in 14 areas with representatives of 327 companies who had employees needing agricultural training. The most common type of business employing agriculturally trained persons was engaged in sales and service of agricultural products and farm supplies. About 20 percent of the 24,305 persons employed by the companies needed agricultural training. Company representatives indicated that in the near future, 1,400 new agriculturally trained persons would be needed. The need for actual farm experience was rated high by all employers. Of the companies where interviews were conducted, it was found that they obtained their new employees from other companies. (The Center for Research and Leadership Development in Vocational and Technical Education, 1965).

A study was made to determine whether selected personal characteristics of students and those of their family environments were associated with continued enrollment in vocational agriculture. Findings were:

1. Students who continued vocational agriculture (re-enrolled) differed from students who transferred to other courses in that (a) more re-enrollees lived on farms; (b) re-enrollees had a more favorable attitude toward farming as a way of life; (c) more re-enrollees stated occupational choices related to agriculture; (d) the occupational choice of re-enrollees was more consistent within aspirational levels.

2. Re-enrollees displayed less academic ability and less consideration of long-term educational and/or occupational objectives.

3. No significant difference of transfer and re-enrollee students was found with respect to: (a) sizes of the students' home farm; (b) extent of parental farm ownership; (c) the farm work status of the students' fathers; (d) the ages of the students' fathers; (e) the number of students who expressed at least one occupational choice; (f) the degree of initiative displayed in seeking guidance assistance; (g) the consistency of choices within occupational fields; and (h) the degree of certainty of following their present post-high school plans or engaging in first-choice occupations (Bittner, 1963).

Roberts (1965a) evaluated the effectiveness of instruction in agricultural mechanics for vocational students in Arkansas who entered nonfarming occupations. Findings indicated that 82 percent of the former students graduated from high school and that 42 percent of the graduates and school leavers completed four years of vocational agriculture. Most of their former students (82 percent) were employed in occupations not related to agriculture. Most of the former students were semi-skilled workers and 73 percent were employed in the same county in which they attended high school. Eighty-two percent who entered nonfarming occupations indicated that the skills they acquired in agricultural mechanics were useful in the occupation in which they were engaged. About 32 percent indicated a need in their occupation for additional mechanical skills not acquired in the agricultural mechanics course. Data showed that more former students from the larger school districts indicated a need for a greater number of additional skills than did students from the smaller districts.

A study to analyze the educational requirements for off-the-farm agricultural occupations in Yuma County, Arizona, was made by Wagley (1964). It was found that the most common types of businesses that employed agriculturally trained persons were those engaged in sales and service. The next largest group was engaged in providing services. Slightly over 14 percent of the 5,487 persons employed in 121 businesses studied were estimated by the employers to be in need of specific training in agriculture. Educational needs in salesmanship and customer relations were rated higher than technical agricultural training needs for employees in these businesses. Eighty percent of the employers said they would be glad to work with school personnel in planning the curriculum for prospective employees of off-the-farm agricultural occupations and in conducting training programs.

A study was made in 1965 to determine present and future job opportunities in agriculturally related firms and the degree to which such firms accept high school level trainees. Findings were that:

1. Ranked by number of industries, ornamental horticulture and produce industries accepted more trainees than did livestock, farm supply, and farm machinery industries.

2. Produce industries had the highest number of part and fulltime employees.

3. Ornamental horticulture was the industry in which the largest expansion of employees was planned (27 percent) in the next five years.

4. Of anticipated new employees, a larger percentage will be needed in sales and skilled positions rather than in semi-skilled and technical areas.

5. It was believed by personnel in a majority of the firms that a combined agricultural and business major, with a work experience program at the high school level, would be of value in San Jose.

6. Twenty-five percent of the firms agreed to cooperate as work experience stations. Most preferred senior students (Vaughan, 1965).

Bible and McComas (1963) studied several hypotheses regarding the effectiveness of teachers of vocational agriculture. It was found that:

1. Vocational agriculture teachers rated "high" in effectiveness by administrators had a greater degree of consensus on role expectations than did teachers rated "low" in effectiveness.

2. The more effective vocational agriculture teachers seemed to do a better job of communicating role expectations to their school administrators.

3. There was a greater agreement on perception of role expectations than on role performances.

4. Job satisfaction was related to teacher effectiveness and to consensus on role definition among teachers.

A study was made of factors influencing the vocational choices of agriculture college freshmen. Persons influencing the largest percentage of freshmen were fathers, mothers, teachers of agriculture and friends. Significantly more freshmen were influenced by teachers of agriculture than by any other professional person. The seven factors influencing most freshmen to choose agriculture as a career were:

1. Experience in farming.
2. Desire to work with farm people.
3. Desire to live on a farm.
4. Work with livestock.
5. Fathers.
6. Work with farm crops.
7. Opportunity for employment.

In general, the more experience agriculture college freshmen had in vocational agriculture, FFA and 4-H Clubs, the more influence they attributed to teachers of vocational agriculture, 4-H, and FFA clubs.

"Opportunity" factors selected by more than 40 percent of the freshmen as one of the five most important factors in a job, in order of importance, were as follows:

1. To earn money.
2. To use your own ideas.
3. To be certain of continuous employment.
4. To be your own boss.
5. To do a variety of work.
6. To do good for others.
7. To be able to advance.

Very few freshmen indicated that fame, clean working conditions, prestige, travel and positions of authority were among the five most important factors in a job (Bentley, 1963).

A survey was conducted of vocational agriculture in local school districts in which short courses had been held by adult education specialists in a Texas education agency to determine the effects, if any, these courses had on the programs for adult and young farmers in the district. In general, these courses were valuable to them and to the local vocational agriculture instructors. Participants preferred the short intensive type instructional program in comparison to the more general type (Holt, 1963).

An investigation was made by George (1965) to determine what farm mechanics jobs were being taught in the day classes of Missouri high schools in departments of vocational agriculture. The mean suggested farm time to be spent on farm mechanics subject matter areas was given by the teachers. Suggested time included 35.1 periods for farm engines and tractors, 24.0 for woodworking, 20.7 for farm machinery, 18.8 for electric welding, 16.0 for electricity, 12.3 for oxyacetylene welding, 10.8 for cold metal work, 8.7 for farm plumbing, 1.7 for farm structures, 7 periods for forge work, 5.3 for the farm service center, 4.9 for farm painting, 4.8 for soldering and 4.1 periods for farm fencing. The mean suggested program of instruction in the farm mechanics phase of vocational agriculture totaled 200.3 periods of instruction as compared to a mean program of 173.8 periods for the school year 1962-63 and the suggested list of 146 periods. Teachers also indicated reasons for changing the program. Juergenson and Davis (1963) conducted a study in an attempt to determine the work experience opportunities for high school agriculture students in farming and related agriculture industries. The findings were as follows:

1. Farmers and related industry would cooperate in a work-experience program.

2. Jobs were available for high school students during weekends and summer vacations.

3. Employers expected to pay respectable wages even though they agreed to go out of their way to provide a variety of experiences for trainees.

4. Supervision by the teacher of agriculture was welcomed and in most cases performed.

5. Age of student was not a factor, although most coordinators would prefer high school students in the junior or senior age brackets.

6. Personable students, those able to meet people, and especially those with qualities of dependability and responsibility were most sought after by employers.

7. Neither insurance nor union regulations were impediments to a work experience program.

8. Most cooperators preferred to select trainees from a list of qualified students prepared by the teacher of agriculture and, in addition, desired some form of written recommendation by the teacher. Permission of parents was found necessary.

9. Those interviewed were unanimous in their support of a work experience program, even if they were not able to hire such a student in their own operations.

Business Education

Eight case studies of automation were made by Roberts (1965b). Cost reduction at the time of automation appeared to be the major objective of a decision to automate. In all but two cases, cost reductions resulted from increased productivity. Automated operations tend to produce less scrap, less in-progress inventory, and less plant space. Automation increases the role of fixed costs relative to variable costs. Companies implied that they automated in an effort to improve the quality of customer service and firm "image". Factors of marginal importance that influenced decisions to automate were: Volume of clerical and paper work, unsatisfactory temporary labor, the need for reliable production planning, and the mitigation of pilferage, goods breakage, shortage of skilled workers, volume fluctuations and growth. The general conclusion was that companies will neither anticipate all the effects, nor be perfectly accurate in estimating the impact of the effects forecast. However, when careful studies are made, the important effects can usually be anticipated and quantified as accurately as is necessary.

A survey of the academic status of high school seniors enrolled in distributive education cooperative programs was made during the school years 1954-55, 1957-58, and 1960-61. (Mills, 1964). Eighty-five schools in 28 states were represented. The findings of this study indicated that the achievement of high school students in distributive cooperative education (70 percent in the lower two quartiles of respective graduating classes) compared favorably with their ability as reflected by mental maturity scores (80 percent between 85 and 114). Distributive education cooperative students have a greater tendency to complete high school than do their fellow students in the secondary school.

Prohaska (1965) made a study to determine whether or not the study of electronic theory had an essential place in the secondary curriculum; and to determine whether or not courses of study in electronic theory had broad or narrow limitations in their applications. It was found that:

1. The fastest growth in electronic employment was in professional and semi-professional areas.

2. Currently, women constitute one out of three electronic workers.

3. A technician's place in the occupational hierarchy was midway between a professional and a craftsman.

4. A department of science technology should be established at the secondary level to develop and teach courses in the various leading technologies.

Martin (1963) conducted a study to determine the current status, practices and problems of the cooperative office work experience programs that were in operation in the public high schools in New Jersey. The majority of principals believed that the cooperative office work experience program contributed to the schools' objectives. The work experience program was overwhelmingly supported by businessmen. The coordinators were well trained and received the support of the school administrators. The investigator suggested that the program be expanded.

LaSalle (1964) attempted to determine what direction business education might take toward instruction on automation-data processing. It was found that:

1. Automation, although proceeding at an accelerated pace in offices, has received little attention at the high school level.

2. Business education departments would be well advised to offer a separate one-year course on automation at the twelfth year.

3. The senior level course on automation should include the following units: types of automated equipment, employment opportunities, orientation to data processing and automated equipment operation.

4. Useful skills include communication, problem-solving and logical thinking.

Nelson and others (1962) conducted a study to determine whether interest value of copy material for typewriting affects typing speed and/or accuracy. It was found that the mean gross words per minute for interesting and uninteresting material was the same. The mean number of errors for interesting materials was 4.29; for the uninteresting material it was 4.61. There was no significant difference in speed or accuracy of typewriting on interesting or uninteresting material.

Hayer (1965) made a comparison of the achievement of high school pupils completing the Carter Briefhand course with the achievement of high school students completing one and two semesters of Gregg Shorthand. It was found that:

1. The difference between Gregg I and Briefhand was significant at 50, [illegible] and 70 words per minute, but not significant at 80, 90 and 100 words per minute.

2. There was a difference between Gregg II and Briefhand significant at 60, 70, 80, 90 and 100 words per minute in favor of Gregg II.

The investigator concluded that for those pupils planning one semester of shorthand, the Briefhand course is of more value; for those desiring two semesters, Gregg would provide a higher level of achievement.

A study was made by White (1963) to determine the relationship between typing performance and measured mental ability in a Negro high school. Findings were as follows:

1. First-year grade average was significantly related (5 percent) to the final typing grade.

2. Factors in the Primary Mental Abilities Test were correlated with typing grade: Space (r=.52); Number (r=.47); Word Fluency (r=.76); and General Intelligence (r=.47).

3. The scientific interest scale, the ability to discover new facts and solve problems, was the only interest scale significantly related to the Final Typing Grade (r=.56 at 1 percent).

A study was conducted by Hallam (1965) to make recommendations regarding areas in business education needing research. It was found that:

1. The primary area of business education in need of research was automation and data processing, specifically the curriculum and course content.

2. Secondary areas of business education in need of research were shorthand, teaching, typewriting, bookkeeping and accounting, guidance, curriculum and course content, measurement and standards, and general business.

A study to determine what evidence existed concerning digit and symbol patterns in selected types of business communications was made by Grill (1965). Findings were:

1. The position of the "o" key should be changed to a more strategic location near the center of the top finger, allowing the use of a stronger finger.

2. Digits, alphabetical symbols and non-alphabetical symbols occurring most frequently should be practiced frequently by the students.

3. Statistical typing for vocational purposes should include methods for developing and maintaining a mastery of the digit and symbol keys.

4. Teacher-directed practice in the development of digit and symbol control should be incorporated in the daily typewriting instructional program.

Industrial Arts and Trade and Industrial Education

An attempt was made by Prichard (1963) in Pennsylvania to analyze the relationship of attitudes of school board members toward vocational trade and industrial education. Administrators and board members in 16 schools having trade and industrial programs were compared with their counterparts in 16 schools not having trade and industrial programs. In districts having trade and industry programs it was found that:

1. Older board members had more favorable attitudes toward trade and industrial programs.

2. Neither the occupation nor the number of years of formal education were related to board members' attitudes toward trade and industrial programs.

3. Members who had heard of the curriculum from industry, local supervisors and administrators had a more favorable attitude toward it than those who had not.

In districts not having trade and industrial programs, it was found that:

1. The age, or number of years of service on the board, was unrelated to the attitude of the board members.

2. Board members who were blue collar workers had significantly more favorable attitudes.

3. College graduates had decidedly less favorable attitudes than did others.

4. Board members who had heard of the curriculum from counselors, industry and labor organizations were more favorable toward the program than were others.
5. Superintendents of schools having trade and industrial education were more favorable toward each program than were principals of schools having such programs.

In a study made by Wold (1962) to ascertain the practices employed in selecting students for technical curricula and the relation of these practices to student completion rates, the following findings and conclusions were made: When 129 public and 40 private schools were considered, it was found that 55 percent of the schools had a minimum age requirement and that almost nine-tenths had no maximum age standard. Forty-seven percent required no scholastic average for acceptance; 41.6 percent required a "C" average. About one-third of the schools used tests and interviews to screen applicants. Academic difficulties and financial problems were the chief causes of dropouts. Entrance seemed to be based on high school graduation, average grades and some background in English, algebra and plane geometry. The use of screening tests seemed only to approximate the level of its greatest potential. It appeared that applicants generally attracted to technical curricula were below the calibre necessary for successful completion.

Students of Hartford and Norwalk State Technical Institutes in Connecticut were utilized by Righthand (1965) in a study to determine some of the sociological and psychological charateristics distinguishing freshmen dropouts from persisting students. It was found that, of seventeen variables, mathematical ability and study habits discriminated between attrition and survival groups.

A sample of 1,292 trade and industrial graduates was drawn from 24 Iowa schools by Dilts (1964) for a study of trade and industrial progress. Trade and industrial education programs were in operation in these schools during the sample years of 1957 and 1961. Some of the major findings were:

1. The means for identifying and selecting students for trade and industrial programs were inadequate in most areas.

2. Placement service for graduates was inadequate.

3. Schools did not have a comprehensive picture of the success of their programs based on students' vocational success.

4. Some of the more common areas of trade and industrial programs may have been obsolete, or at least limited in terms of job availability for graduates.

5. Opportunities for students in day-trade programs were extremely limited in most areas.

6. Cooperative education programs offered the broadest range of jobs for which students could train.

7. Trade and industrial programs were flexible enough for students to prepare for other vocations.

8. Trade and industrial students who had been out of high school five years placed a higher value on mathematics and English than did those who had been out of school only one year.

9. Only 30 percent of the trade and industrial graduates were found to be working at a trade for which they were trained.

10. Graduates working at a trade for which they were trained indicated that they were satisfied with their high school program.

A follow-up of 49 educable mentally retarded high school graduates was reported by Carson (1965). At that time, 90 percent of the boys and 75 percent of the girls were gainfully employed. The author concluded that, as an adult, the mildly retarded youth tends to be more or less self-supporting. However, he needs extensive professional attention while growing up. These people may be trained for a wide variety of jobs.

Millet (1965) obtained data from 849 male graduates from five vocational-technical schools in Alabama in 1962-63 by using questionnaires. Significant findings of this performance assessment were:

1. There was no statistical difference between high school graduates and high school dropouts in vocational school achievement.

2. High school standing was not an efficient predictor of success in the vocational school.

3. There was no major difference between white and Negro students in the importance of high school graduation to success in vocational school.

Moss (1966) studied the influence of high school industrial arts experience on grades earned in post-high school trade and technical curriculum clusters at the William Hood Dunwoody Industrial Institute. There were 444 students involved in the curriculum cluster of automotive, drafting, electrical and machine shop. The students involved in the study had received varying amounts of high school industrial arts training, ranging from none to more than six semesters. It was found that differences in amount, content and objectives of high school industrial arts experience had no observable influence on the grades achieved by students in any of the four curriculum clusters. Futhermore, high school academic courses, particularly in the physical sciences, appeared to be as effective as high school industrial arts experiences in preparing the students for the industrial institute. The investigator cautioned that although superior performance was reported of the students prepared in physical science, no consideration was given to their aptitude. He did warn that the study raised serious questions about the prevocational value of high school industrial arts.

A study was made by Hunt (1965) to determine whether or not the job upgrading program of the Detroit Public Schools was effective in adjusting the preference dropouts held for jobs known to be available. It was found that:

1. There was a significant difference between the preference that dropouts held for jobs related to the length of time they were out of school. Those who had spent the shortest period of time out of school prior to entering the program were found to aspire for higher type jobs after four months in the program than dropouts separated for the longest length of time.

2. Four months of job upgrading experience did not seem to change preference for jobs.

3. Those whose goal it was to return to school showed a preference distribution for jobs much in the same way as did those whose goal was employment.

4. Reading grade levels for either sex were not statistically correlated with job preferences.

5. Males electing to return to school and females seeking employment were found to have the stronger characteristics in the sample group.

6. Both males and females distributed their individual preferences equally between higher and lower type jobs.

7. Racial characteristics of the subjects incorporated in the project test were not found to influence preferences for certain jobs.

8. Reasons given for preferring or rejecting jobs were not found to change over four months' time.

9. Youth involuntarily excluded from school were found to populate the programs in greater numbers than those who left voluntarily.

A study was made by Moss (1963) to make available information concerning the educational and occupational experiences of a group of high school dropouts and graduates of schools located in a labor surplus area that was receiving financial and technical aid under the Area Redevelopment Act. It was found that half the students left the county in search of employment or to attend college. A majority who had taken post-high school education was living outside the county. Three-quarters of the females had taken some type of high school vocational course; over half the males had not. Half the students were in the labor force full-time. Half the unemployed were dropouts. A majority of male graduates were employed in "skilled" and "service" occupations. Male dropouts were employed in "unskilled", "semi-skilled", and "service" occupations. A majority of female graduates were in "clerical" occupations and female dropouts were in "service" occupations. Of the former students who had taken vocational agriculture, home economics, commercial or trade and industrial courses, a majority was employed in occupations unrelated to their training. Of the high school graduates who would not support vocational education, a majority demonstrated below average scholastic aptitude.

In an effort to ascertain the effectiveness and adequacy of vocational-industrial day-trade preparatory programs in Arizona high schools, James (1965) found that of the 409 former students participating in the study, 218 (53 percent) had completed the minimum requirements for their particular area. One hundred and twenty-one (26.6 percent) were enrolled for a period of less than nine months. The greatest single factor influencing enrollment was increased interest in a shop or laboratory subject. When asked to indicate the trade or occupation they hoped to be engaged in within the next ten years, 48.8 percent listed something unrelated to the preparatory program in which they had enrolled. Former students were found to be attending a variety of educational institutions after leaving their preparatory programs, with 53 percent pursuing curriculums unrelated to their previous preparation.

In general, employers rated former students average to above average in factors concerned with their adjustment on the job. Social-personal characteristics far outweighed both skill and related technical knowledge in importance when difficulties encountered on the job were considered.

Of the total number of students included in the study, 40.8 percent entered the occupations for which they were prepared. If the post-high school areas were omitted, this figure would drop to 23.9 percent. Students obtained jobs through their own efforts; only 2.2 percent were assisted by school counselors.

A study was made by Hawse (1965) to identify those population groups that were vitally interested in the education of our youth and to ascertain from them, through the use of an opinionnaire, the amount of education needed and the type of education that should be stressed. Five population groups sampled were: industrial arts teachers, industrial arts teacher educators, high school administrators, industrial employment officers and parents. These groups were generally in agreement. All rated appreciation and use as "desirable" and rated as "very important" the following objectives: self-realization and initiative, cooperative attitudes, health and safety, interest in achievement and orderly performance. The author concluded that there was basic agreement on the value of the industrial arts objective subscribed to by the industrial arts teachers in America, and this should tend to produce a definite direction for those teachers.

An attempt was made by Echer (1965) to determine the status of industrial arts laboratory courses in power mechanics at selected teacher education institutions. The findings were:

1. Two philosophical points of view exist: one advocates a vocationally-oriented program devoted to the service aspects of the automotive industry; the other conceives this program as including divisions of technology-power, transportation and service.

2. The applied science approach has influenced the content of the courses historically.

3. Major instructional units indicated in 70 percent of responses included the following: small gasoline engines, power measurements, mechanical power transmission and diesel engines.

4. An eclectic position for selecting content for this course was indicated by a majority of respondents.

5. The power-mechanics course should emphasize the understanding of operational fundamentals and the scientific principles involved in each energy source studied.

A study of the judgment of experts and practitioners concerning superior practices in elementary school industrial arts was made by Williams III (1964). Subjects were 82 of 100 elementary school industrial arts teachers who responded to an inventory-type survey. Over half indicated they were conducting superior elementary school industrial arts experiences based on:

1. Meeting emotional needs of children.

2. Meeting objectives of industrial arts as related to the personal needs of pupils.

3. Meeting safety requirements as related to the physical needs of students.

4. Developing informative and planning skills within the pupils.

5. Developing manipulative skills within the pupils.

6. Using individual instructional procedures.

7. Using materials for construction.

As a result of this study, it was recommended that the elementary school industrial arts program be conducted in the combined facilities of the shop and classroom and not in either alone.

Three investigators evaluated the use and need of selected elementary school industrial arts hand tools (Bonde, 1965; Hansen, 1965; Doutt, 1965). By observation of students working with hand tools of various sizes and weights, they were able to make recommendations. The final recommendations reflected factors of efficient utilization, economy in purchasing and suitability for most students. The summary of each investigator's findings is shown in the table on the following page.

EVALUATION OF INDUSTRIAL ARTS HAND TOOLS FOR ELEMENTARY GRADES

	Investigator and Grade							
	Bonde	Doutt			Hansen		Hansen	
	I	II	III	IV	V		VI	
TOOL					Male	Female	Male	Female
13 oz. hammer	x	x	x	x	x	x		
16 oz. hammer							x	x
Rigid frame coping saw	x	x	x	x	x	x	x	x
8" bit brace		x	x	x	x	x		
10" bit brace	x			x			x	
18" crosscut saw		x	x	x		x		
20" crosscut saw	x						x	x
24" crosscut saw					x			
3/8" hand drill		x	x	x	x	x	x	x
Block plane		x			x	x	x	x
Smoothing plane			x					
Jr. Jack plane				x			x	
16" sawhorse	x							
18" sawhorse					x			
20" sawhorse						x	x	x

Whitten (1962) conducted a study to discover criteria that have the greatest relationship to success in a vocational high school program, and that can be used successfully in the selection of students from among applicants who have completed the ninth grade. The multiple correlation coefficient for vocational school achievement was .495. Variables that contributed to the correlation of the .01 level were industrial arts or home economics, ninth grade attendance, intelligence, arithmetic and ninth grade social studies. Ninth grade attendance was the best indicator of persistence and probability of a student's graduation and also showed a marked relationship to achievement.

Mehallis (1964) conducted a study to assess the values of the industrial arts award program. The study presented the perceptions of 113 industrial arts teachers. Findings revealed that some values were ranked higher than others. Values ranking the highest were improving student-teacher morale, fostering public relations, stimulating curriculum development, increasing the support of industrial arts and strengthening administrative relations. Lesser values were promoting student election of industrial arts, developing industrial and trade relations, increasing employment opportunities, recruiting industrial and professional personnel and recruiting of industrial arts teachers. The study revealed that the industrial arts laboratory has done much to arouse creativity and desire for youngsters to experiment, investigate, manipulate, organize, evaluate, and to operate and test the materials, processes and products of industry that enable them to compete on a developmental basis. Students have not only shown outstanding ability to achieve but have created an educational feed-back to the teacher that stimulates the teacher to keep up with the technology.

Larsen (1965) made a study to determine what techniques of industrial arts laboratory organization and industrial arts curriculum content could be derived from the concepts and practices of modern industrial management. The findings were:

1. Industrial management, as a resource, did provide curricular experiences, subject matter content, and personnel organization patterns that were continually related to the values and general objectives of industrial arts education.

2. Management concepts should provide curriculum content for other divisions of the curriculum, and not constitute a separate division of their own.

3. Management personnel organization plans should be patterned from industrial practice, should promote student stature and participation from industrial practice, in addition to promoting the smooth operation of the industrial arts laboratory.

A study was conducted by Blomgren (1963) to obtain research evidence regarding the relative understanding of American industry by industrial arts education students in their freshmen and senior years of college. Conclusions were:

1. The freshmen industrial arts students brought to college a lower level of understanding of industrial America than did non-industrial arts students.

2. The senior college industrial arts students showed a higher level of understanding industry than did the freshmen industrial arts students.

3. The non-industrial arts seniors of this study did not show a greater understanding of all phases of American industry when compared with an industrial arts senior.

4. Students enter college programs of industrial arts education with a lower level of understanding of industrial America than do students entering social science programs.

An examination of industrial arts courses in drafting, electricity-electronics and general metals, as suggested for the secondary schools of California for their comformity to contemporary developments in industry, was made by Phares (1963). It was found:

1. The three industrial arts courses examined in this study contained a substantial central core of curricular items that were currently essential in industry.

2. From 7 to 15 percent of the items were judged to be obsolete or non-essential practices. These reflected the rapid scientific and technological changes in industry and a lack of periodic revision necessary to maintain up-to-date industrial arts courses.

3. Because industrial innovations are occurring so rapidly, there was not the same awareness of contemporary developments in industry on the part of teachers, teacher-educators, and curriculum specialists that there was among industry-oriented specialists.

Bailey (1962) conducted a study to ascertain the relations of experience in industrial arts to achievement in design. An instrument constructed specifically for the study was used for this measurement. It was found that:

1. Continued study of industrial arts, as represented by the possession of more units in the area, did not yield an advance knowledge of design.

2. Students who elected an increasing number of industrial arts courses tended to possess lower scholastic ability. Apparently neither industrial arts departments nor arts departments were making significant contributions to the design knowledge of high school senior boys as measured by the instrument used in this study.

McMurry (1965) completed a study to ascertain whether or not self-instructional materials could be applied successfully to the teaching of related information in the junior high school comprehensive general shop. Some of the findings were:

1. The informational achievement of the control and experimental groups did not differ significantly.

2. No significant difference was found to exist in the attitude of the two groups toward the course.

3. Significantly less time was required by the experimental group to receive instruction in related information.

4. Significantly less time was required for the instructor to present instruction to the experimental group than was required for him to present instruction to the control group.

5. The preparation time and cost of the self-instructional materials were considerably greater for the experimental group than for the informational assignment sheets.

A study was conducted by Sams (1961) to determine the influence of automation on-the-job requirements of two groups of skilled tradesmen, tool-makers and machine-repairmen, and the effectiveness of the preparation of graduates of vocational machine shop programs for entry into apprenticeship of the trade. Conclusions were:

1. There was no indication that automation had any real influence on the skill requirements for those tradesmen.

2. Automation definitely brought increased importance to technical knowledge pertaining to the basic fundamentals of hydraulics, electricity, electronics, pneumatics, and the machining properties of plastics.

3. About 60 percent of skills as practiced in the two trades were closely related.

4. The instruction given in related technical information to persons enrolled in the machine shop programs was substantially in agreement with the importance ratings given by tradesmen.

An assessment was made by Schamelhorn (1965) of current thinking of educators and engineers regarding suitable curriculum content of an engineering graphics course of study. Findings were:

1. Engineering graphics educators identified four primary areas: descriptive geometry, engineering drawing, graphic representation, and problem solving and application.

2. Practicing engineers considered these areas of

importance: basic skills, dimensioning, visualization, working drawings and modern graphical approaches.

The investigator recommended the following graphics course time breakdown: engineering drawing (60 percent); descriptive geometry (17 percent); problem solving and applications (15 percent); graphical representation (6 percent); modern graphical approaches (2 percent).

Jones (1963) conducted a study to provide basic information about current programs of cooperative engineering education in the institutions of higher education in the United States. An overwhelming majority of college coordinators, engineering faculty members, industrial coordinators and engineering supervisors felt that the cooperative engineering education programs had greater long-range value for the student than did conventional programs. Ninety-six percent of the students stated that regardless of financail or other considerations, they preferred the cooperative plan. Faculty and engineering supervisors decidedly favored more programs of cooperative engineering education. In every instance of comparison, cooperative students were rated equal to or better than students enrolled in conventional curricula. The investigator believed that existing programs of cooperative engineering education were successful.

The National Tool, Die and Precision Machinery Association (NTDPMA), under the auspices of the U. S. Department of Labor, developed a tool and diemaker apprentice program (Anonymous, 1965b). One of the innovations of the program was a 12-weeks' pre-training program held seven hours a day, five days a week in a local vocational school. After one year of on-the-job training, the apprentices in the experimental group took the four-year Connecticut graduate apprentice examination; they scored an average of 1½ points higher than apprentices who had taken the conventional four-year course. By comparison, they were from 6 to 12 months ahead, said participating shop owners.

Shoemaker (1962) made an appraisal in industrial arts, of instructional materials prepared by industry for home-use equipment. Two hundred and twenty-one samples of printed directions for 34 products were analyzed. The findings indicated that instructional materials for home-use equipment were inappropriate for general use in industrial arts.

However, some samples were good. Readability of the materials varied from the 7th to the 12th grade level. Major shortcomings of the materials were a lack of safety instructions, specific references to illustrations, and how to work with equipment in case of difficulties.

An investigation was conducted by Ketcham (1964) of specialization factors in the secondary school industrial arts programs in the Connecticut public schools. Findings showed that industrial arts programs in Connecticut public schools emphasized the traditional areas of drafting, woods and metals. Little attention was paid to developments in electronics, electricity and power mechanics. Many educators believed that extensive specialization should be developed in the shops. They also indicated a need for further clarification of the respective roles of state vocational-technical schools and industrial arts programs in local public high schools. There was an expression of need for an increased number of terminal courses in industrial arts and more qualified teachers with intensive training and broader experience in specialized areas.

DeVore (1962) attempted to determine basic learning in graphic representation essential to employee adaptations in production industries. Some conclusions reached were as follows:

1. Graphic representations considered useful for adaptation and training in the industries investigated were those determined as basic to job performance during current employment.
2. A common base of graphic representations was determined to exist among the diverse production industries investigated and a "true" rank order of graphic representations for both current employment and training that existed for each skill level.
3. A definite difference existed in the determined usefulness of graphic representations for each skill level investigated and the established usefulness of selected graphic representations for both present employment and training.
4. A significant difference was established by the unskilled production worker category, favoring the

usefulness of graphic representations for training versus present employment.

A study was made by Lemons (1965) of relationships between mechanical drawing experence, certain measures of academic ability, and knowledge of drawing fundamentals to determine criteria for assigning students to accelerated sections of engineering drawing. It was found that:

1. Students with at least two semesters of mechaniical drawing experience had sufficient knowledge of fundamentals to qualify for placement in accelerated engineering drawing courses.

2. The number of semesters of mechanical drawing experience was the best single criterion for assigning students to accelerated sections. Students with and without mechanical drawing experience did not make significantly different scores on aptitude and achievement tests.

A study was made by Jackman (1962) of the industrial arts competencies employed by occupational therapists in Minnesota, with implication for curriculum requirements and teaching procedures. Findings were as follows:

1. Few therapists had instruction in trade and job analysis, and in vocational guidance.

2. Most skill classes taken by therapy students were offered by art and industrial arts departments.

3. Woodwork and crafts accounted for over 70 percent of the instructional elements used by therapists.

4. Subjects used by over half the therapists working with patients were, in order of frequency of use; hand woodworking, leather, stencilling, floor loom weaving, ceramics, art metal, linoleum block and metal enameling.

5. More than four out of five therapists used audiovisual aids in treating patients.

6. Approximately half the therapists had been requested to lay out a clinic floor plan, while one-fourth of them were required to submit a budget periodically.

7. Most therapists were responsible for ordering and maintaining tools and equipment, but only one-fifth had taken such instruction.
8. At least half of the therapists had used, or thought they should use, machine woodwork, metal-enameling, printing and carpentry in the treatment of their patients.
9. Problems some therapists encountered in skill subjects were lack of depth of training, lack of training in tool conditioning and maintenance, and lack of training in the heavier crafts.
10. There was a lack of agreement among occupational therapists concerning how far they should go, or what their role should be, in prevocational therapy.

Vocational Guidance

In a study of pre-school children, Webster (1963), found that psychological characteristics were more closely related to degree of mental retardation than was any other diagnostic factor. Reiber (1966) tends to agree when he stated that mental retardation is basically a behavioral abnormality. He also stated that the problem of mental retardation was complex and may be related to a variety of genetic, biochemical, physical, and environmental abnormalities.

Several investigators found classrooms with a high level of vocational guidance helpful to students in making occupational choices: (Toporowski, 1961); Rosengarten, 1962); (Green, 1964); (Wright, 1965); and (Ryan, 1965). High school counselors found that group vocational counseling of students was equally as effective as individual counseling (Duncan, 1961) and (Swanson, 1964).

A study was made of the effects of an occupational program on high school seniors (1953-56) who did not intend to go to college (Rosengarten, 1962). Annual differences between the mean weekly earnings of the experimental and control groups showed that in three out of four cases, those in the experimental group received higher wages. Annual differences between the means of the number of weeks employed per year of the experimental and control groups favored the experimental groups. Differences between mean job satisfaction scores favored the experimental group in three out of four classes. Differences between mean merit rating scores favored the experimental groups in three out of four classes. None of the above differences was statistically significant. During the four years of the experiment, the experiment group earned $23,991.80 more than did the control group. The cost of the course was $6,273.75. The difference in these figures, $17,718.05, suggests that the workshop was well worth the cost.

An analysis was made by Ruff (1963) of the occupational adjustment problems of young adults in St. Joseph's County, Indiana. It was found that three factors: high school course of study, church attendance, and socio-economic status, had a significant effect on the occupational adjustment scores of young men; and the marital status, children, and number of previous jobs had a significant effect on women's scores. One factor, level of schooling, had a significant effect on the occupational scores of both men and women.

A study was made to determine whether or not there was a significant attitudinal difference toward school among potential dropouts and non-dropouts in grade ten of a large metropolitan high school (Speer, 1965). Findings indicated that there was no significant difference between the two samples with respect to occupational status of parents, chronological age, scholastic aptitude and mechanical reasoning. A significant difference was found in the socio-economic status variable, but a close inspection of the data in this respect suggested strongly the spurious influence of chance factors. There was found to be a significant difference between both groups with respect to reading ability. Results indicated clearly that there was a common attitudinal factor which could be measured to differentiate significantly the potential dropout from the non-dropout.

A study by Seavitt (1966) examined the occupational impact of high school experiences on non-graduates and non-college bound students who had graduated from high school. Findings were that: (a) a postive relationship existed between high school graduation and status employment, (b) there was no observable direct relationship between the types of courses pursued and employment for high school graduates and non-graduates, (c) non-graduates had an earning power comparable to graduates, (d) graduates aspired to higher status jobs than did non-graduates, (e) graduates expressed greater satisfaction for the nature of their employment than did non-graduates, and (f) non-graduates appeared to express a stronger desire for job improvement for reasons other than of a monetary nature.

Two hypotheses were explored in a study by Freedman (1963).

1. For boys who left high school at 16, the succeeding first year of the trail work period had little or no relationship to (a) change in aspiration or (b) crystallization of vocational plan.

2. An increase in degree of alienation from society accompanied a high degree of floundering during the first year of work experience for the population that was considered.

Results: The hypotheses was upheld for 1(a) and 2, hypotheses rejected for 1(b) -- those boys with one or two jobs and high tenure were most likely to be moved in the direction of crystallization of vocational plans.

A study was made by McRae (1963) concerning the relationship between preferences as measured by the Kuder Preference Record (Vocational Form C) and job satisfaction seven to nine years later. Persons currently employed in jobs compatible with high interests, measured earlier, expressed a significantly higher level of satisfaction than did persons whose present jobs were incompatible with earlier measured high interests. When interests were given as a reason for job choice, a significant difference ($p < .001$) was found between respondents in compatible jobs, and those in jobs which were incompatible with earlier measured high interests. Respondents reporting a moderate or high level of over-all satisfaction with their present jobs aspired to jobs with a compatibility status similar to that of their own jobs, whether their present jobs were classified as compatible or incompatible with earlier measured high interests. Individuals rated as having experienced low overall satisfaction with their present jobs, however, did not show a distinct tendency in this regard.

In an effort to determine the relationship that existed between adolescent occupational aspirations and subsequent occupational attainment, Kuvelsky (1965) found:

1. Adolescent aspirations were related to subsequent occupational attainments in a positive manner.
2. The possession of a given aspiration level was by no means a guarantee of attainment.
3. Of the status symbols identified as influencing attainment or non-attainment of aspirations, education was generally the most meaningful attribute for explaining differential deflection.

Wagner (1963) reports on the evaluation of the vocational counseling program of the Employment Security Service of a county in West Virginia. He found that the testing and interpretation given the students was effective, and helped the student gain insight into vocational planning. Employment counseling was most effective during the tenth year and least effective during the twelfth year.

A series of television programs on occupational information was presented to 951 high school junior and senior students in the San Bernardino area. Of this number, 153 students participated in a study to judge the effectiveness of the programs. The students, high school counselors and princiapls considered the programs a valuable source of occupational information. Programs were ranked high in presenting career development facts, moderately effective in encouraging students to remain in school, and of lesser value in motivating students to think about matters specifically related to job plans. Principals thought the program would be more beneficial if it were presented to students before the senior year (Lawson, 1966).

A follow-up study was made of 18 percent of the 3,880 high school graduates of Sonoma County in California in 1961, 1962, 1963 (Hamilton, 1965). Information obtained indicated that 42 percent of the graduates were employed full-time. An actual unemployment rate of 14 percent remained after deleting those graduates that were housewives or students. Nineteen percent of the students were enrolled in some type of advance education institution, and 8 percent of the graduates were in the armed services. The male graduates were employed predominantly in the operator occupations followed by sales, service and clerical fields. The female graduates were employed predominantly in the clerical fields and the second largest number were employed in the service area.

Adult Education

In a survey made by Pearce (1966b), it was found that about 12 percent of the persons entering the adult basic education program of Modesto Junior College failed to complete the course. Fifty-four percent were employed at the time the survey was taken, and 85 percent had been employed at one time or another since they completed training. Eighty percent of those who were employed indicated that their training had assisted them in obtaining their position.

The Bureau of Labor Statistics (1963) attempted to determine the impact of technological changes on the older worker, and the types of retraining that industry had undertaken to provide them with new salable skills. It was found that:

1. Retraining generally involved upgrading or enlarging the skills of employees rather than a complete change-over to new occupations.
2. Younger workers generally did better than older workers in short-term programs. In long-term programs, older workers did better or as well as the younger workers.
3. Lack of education may have been a more serious handicap for older trainees than for younger trainees.

A study was made by Saleh and Grygier (1966), to explore the differences among groups of employees 55-65 years of age in perceiving their level of productivity in the period immediately preceding retirement. It was suggested by the investigator that those in professional occupations and better educated people should be allowed to continue to work beyond the retirement age.

Sheppard and Belitsky (1965) reported on the job seeking behavior of unemployed workers. It was found that:

1. Among older workers not called back to work, the older skilled workers had no greater advantage than the older semi-skilled workers.
2. The "wide-ranging" approach was more effective in finding a job than one of checking only those companies thought to be hiring.
3. Eighty-eight percent who checked with the State Employment Service found jobs. Sixty-seven percent of those who did not seek help found jobs.
4. Young white skilled workers, regardless of their social-psychological characteristics, were all able to find new jobs. For others, success was related to their degree of achievement and motivation and to the degree of achievement values.

Generally speaking, older, lesser-skilled job-seekers had the most difficulty in obtaining employment.

Mauk (1962) reported on two studies of unemployed fathers. In one, the subjects lacked work skills; had no more than an eighth grade education; each was the father of 3 or 4 minor children and presented a variety of serious racial, economical and emotional problems; and ranged in age from 20 to 44 years. The agency staff members, a work training supervisor, a caseworker and a homemaking teacher worked with the subjects and their families. As the project progressed, the men began to show improvement in self-confidence, ability to assume responsibility and work skills. They also desired to improve their ability to read and write, and a classroom was set up. The other report indicated inconclusive findings.

Steinmann, (1966) investigated the concepts of the feminine work role of 51 middle-class girls attending a suburban college. They were being prepared to enter the work force, but many did not plan to utilize their education. Thirty-five of the 51 wanted to continue working after marriage. Of these, 20 would work only if their husbands needed financial assistance. Seven stated they would work for reasons that combined need for financial assistance and self-expression. Eight wanted to work for self-expression alone. The investigator believed the college counselor should help college girls plan far-reaching programs of intellectual and vocational interest based on their individual activities.

Block and Campbell (1963) conducted a study of Abilities, Inc., a conventional plant in the electronic and aviation subcontracting business. Employment was limited strictly to the physically disabled, who are hired only on the basis of a personal interview. Because of its outstanding safety record this company pays only two-thirds the average annual insurance premiums. It was thought that, generally, an employee in this company had higher job motivation than did the average worker. The disabled person seemed to have greater personal involvement in the values attached to safety precautions. The disabled person also seemed to display relatively less emotion on the job.

A study was made by Rubenstein (1965) to determine selected characteristics which affect the employably handicapped and vocational rehabilitation in economically depressed areas of West Virginia. Results indicated that 11 percent of the population (16-64 years) in a depressed area had disabilities that mitigated their chances of their employment. In a non-depressed area, only four percent of this age group were disabled. A study of the 353 persons rehabilitated in Logan County from 1956-1962 revealed that: 75 percent were males; the average grade level of formal education was 7.6 grades; the average time required for rehabilitation was 15.7 months; the average cost to the West Virginia Division of Vocational Rehabilitation was $280.11; prior to rehabilitation the average weekly income was $13.48, and after rehabilitation the average was $40.65. Conclusions emphasized the need for specialized training for disabled workers in a depressed area; special occupations for employment, such as sheltered workshops; and for specialized surveys to determine the needs in specific areas concerned with the disabled.

An additional attempt was made to determine whether older, handicapped men who participated in a vocational rehabilitation program could be more realistic in the way they perceived themselves as workers; further, whether this perception, based on a sheltered shop performance, was related to the achievement of vocztional rehabilitation. It was found that:

1. Older, handicapped men became significantly more realistic in the way they perceived themselves as workers.
2. The way these men were able to perform in a sheltered shop was significantly related to their achieving vocational rehabilitation.
3. Indirectly, the reliability of self-perception as a worker was related to vocational rehabilitation in that it was a contributor toward the achievement of a higher level of performance in the sheltered shop.
4. Problems such as helath and family relations must be considered in planning vocational rehabilitation programs for older, handicapped men.

A study was made by Kornhauser (1962), assessing the mental health of factory workers and focusing on comparisons of the mental health of occupational groups in the Detroit automobile industry. The data collected indicated that:

1. Mental health was poorer among factory workers from more skilled, responsible, varied types of work to jobs lower in these aspects.
2. The relationship was not due in any large degree to differences of pre-job background or personality of the men who entered and reamined in the several types of work.

Mental health seemed to be dependent on factors associated with the job. The investigator cautioned that if we are to understand why mental health is poorer in less skilled, more routine factory jobs, we must look at the entire pattern of work and life conditions of the people in these occupations -- not at single variables.

A study was made by Bollweg and Garbin (1963) to determine the sources and direction of inter-plant mobility by a representative group of blue collar workers employed in a meat packing plant. Of the 278 workers in the sample, a total of 238 (85 percent) had experienced some inter-department mobility.

Workers who changed jobs voluntarily were discovered to move upward in a significantly greater proportion than did the workers who did not change voluntarily and, conversely, downward mobility was more characteristic of workers who did not change jobs voluntarily. White native-born males composed over one-half of the sample population, while 25 percent of the sample were male Negroes. There appeared to be little differences in the reasons of mobility with respect to upward and downward movement experienced by members of both races.

Cohen (1963) conducted a study to determine and analyze the relationships between certain characteristics of employers and their expressed attitudes toward hiring retarded persons. He found there was significant negative relationship between years of schooling and attitude toward hiring the retarded. Almost no difference was noted in the mean realistic concept scores of the favorable (23.91) and less favorable (23.88) groups. This suggested that attitudes were not a function of the realistic concept of knowledge of mental retardation. This also suggested the necessity for a variety of educational programs entailing more than the presentation of the basic facts.

Dellefield (1966) conducted a study to investigate the aspirations, difficulties encountered in realizing aspirations and the opportunities desired in order to overcome difficulties, as expressed by adult Negroes on a low socio-economic level, and to draw implications for adult education from these findings. The findings showed that adults of low socio-economic status did not regard education for themselves as a main life aspiration, but they did consider the lack of education as a key difficulty which hindered them. They did not feel that education might serve as a medium by which life aspirations could be attained. The lack of a job skill was the most frequently mentioned difficulty. Next in order of frequency of mention was lack of money. Lack of education was third as a difficulty preventing attainment of aspirations, but it was substantially below the first two mentioned difficulties. These results point to the desirability of providing better employment preparation activities as a means of encouraging greater participation in adult education by low socio-economic status adults.

Pearce (1966c) found little difference in the way student, teacher, and administrator describe the ideal basic education teacher. The administrator wanted a teacher who was people-oriented; the teacher said they needed understanding; and the student sought a teacher who would help him develop his self-confidence.

Common characteristics were found among basic education teachers. These included wide experience in the world of work, experience in working with subgroups, periods of isolation during life, a family unit during childhood in which there was a single predominant parental figure, childhood spent in a provincial community, and strong individual belief in the value of human dignity. The most important single characteristic possessed by the basic education teacher was individuality.

Teaching Methods

Lincoln and Cahill (1966) conducted four experiments to determine the relative effectiveness of meter and digital displays currently used for checking the status of a missile's hydraulic system. It was concluded that:

1. The tolerance response was performed significantly faster with digital display.

2. Error rates of the two display panels were essentially equivalent on both attitude and tolerance responses. The criterion of accuracy for the digital display was not superior to the panel display.

3. Subjects made significantly more errors in reporting an "intolerance" condition when the display was "out of tolerance" than they made in reporting an "out of tolerance." This bias was independent of the subjects' previous level of experience on similar tasks.

A study was made by Yeager (1965) to determine the effectiveness of projections in increasing initial learning and overall retention, and facilitating review procedures. It was found that teaching time required, using control methods of lecture and discussion, and demonstration could be successfully reduced one-third by using projections. Resulting initial learning and overall retention were equal between methods. It was also determined that review time for tests could be favorably reduced by one-third.

Fowler (1965) made an experimental comparison of two laboratory methods (project and quick-connect) for teaching college-level introductory electricity in industrial education. When the project method and the quick-connect and project method were compared, it was found that:

1. There was no significant difference in relative effectiveness of the two methods in terms of retention of materials learned and student attitudes toward either method.
2. As an aid to understanding electrical theory, the quick-connect method was more effective.
3. A majority of the students preferred the project method.

McCormick (1965) reported that the most readily accepted media for teaching accounting were the projective media, particularly the use of transparencies and the overhead projector. Also, a majority of accounting teachers were of the opinion that projective media were important tools in extending the instructor's range and in improving the effectiveness of instruction, whether it was carried on in the small classroom, large lecture hall, or the television studio.

A study was made by House (1965) to compare managerial reactions to leader-centered and student-centered methods of training in a four-week (160 hour) management development program. In response to open-ended questions, 25 of the 45 respondents indicated a preference for a combination of the two methods. Of these, 12 recommended predominant use of the leader-centered method, with occasional use of the student-centered method for purposes of breaking monotony and maintenance of participant interest. Four respondents preferred the predominant use of the student-centered method. Of the 25 who recommended a combination of both methods, seven recommended the leader-centered method, followed by the student-centered discussion of the main points for purposes of clarification and elaboration.

Dawson (1965) studied whether the introduction of an advance organizer (introduction of concepts before instruction) prior to the presentation of typical industrial arts content facilitated learning and retention of material. It was found that:

1. Organizers facilitated learning and retention of meaningful industrial arts content.
2. The organizer facilitated learning more than it increased retention.
3. The use of the organizer as a subsuming concept was more effective with lower ability students than with those of greater ability.

An attempt to ascertain the relationship between marks earned in undergraduate industrial arts teacher education programs, and subsequent success of industrial arts teachers after ten years or more of teaching experience was made by Powers (1962). Major findings were as follows:

1. There was a low, positive correlation between rated teaching success of the teachers and marks earned by them in undergraduate technical courses in industrial arts.
2. There was a substantial, positive correlation between rated teaching success and marks earned by teachers in academic courses.
3. The correlation between undergraduate scholarship in professional education courses and rated teaching success of the teachers included in the study was substantial.
4. A substantial correlation existed between total undergraduate scholarship and rated teaching success of the teachers included in the study.
5. Predictions of an individual's future success as an industrial arts teacher from his undergraduate scholarship cannot be made with a high degree of accuracy.
6. It appeared that the major effect of scholastic attainment on teaching success of industrial arts

teachers shows up after several years of teaching experience, rather than during the first year.

The investigator suggested that other variables operate to produce successful industrial arts teachers.

A study was made by Wills (1965) to determine the effect of speed-up teaching procedures on the outcomes of shop experience. Findings included the following:

1. There was no significant difference between the experimental and control group with respect to informational achievement.
2. When the factor of attitude toward the course was examined statistically, there proved to be no significant difference between the two groups.
3. There was a significant difference in the amount of work done by the experimental group and the control group, with the experimental group producing the greater number.
4. There was a significant difference in the number of errors made by the two groups, with the control group having the fewer number.
5. The difference in the quality of projects made by the two groups was not significant.
6. There was a significant difference in the economy of the material used by the two groups, with the control group being more economical.
7. As judged subjectively by the investigator, the experimental group required more effort to teach, but was easier to discipline and direct.

The effort expended produced a classroom of students with greater motivation and greater desire to save time.

A study was made by Bjorkquist (1965) to determine the relative effectiveness of scale models and pictorial drawings in helping beginning mechanical drawing students learn orthographic projection principles. Findings were as follows:

1. In the learning task, the group using pictorial drawings required the fewest responses to learn the criterion, followed by the group using models and the group with no aid, respectively.

2. The group using pictorial drawings, and the group using models, learned with significantly fewer responses than did the group with no aids.

3. The group using pictorial drawings solved the problems in the transfer task with fewer responses than did each of the other treatment groups.

Shriver and Others (1964) made a study to determine the effectiveness of using mock-ups as a substitute for real equipment in developing electronic trouble shooting techniques. Results indicated that the group using mock-ups obtained higher proficiency in trouble shooting. The mock-up was substituted for a portion of the training and reduced the requirement for operational equipment by 25 percent.

An experimental comparison of three methods used to identify industrial materials was made by Trautwein (1963). Methods tested were "traditional" (using five human senses), "museum" (by sight alone), and "stero" (also sight alone, but used in combination with a photographic representation). Rank of the means showed the "traditional" method to be superior, the "museum" method to be somewhat below the first method tested, and the "stero" method to be definitely inferior.

Shemick (1964) conducted a study to examine the relative effectiveness of a program presented to learners using an audio-visual teaching machine for treaching metal spinning. The audio-visual method was compared with the demonstration method. Findings were as follows:

1. Students taught by demonstration needed significantly less time to complete a task, but did require significantly more instances of teacher assistance.

2. The group taught by demonstration tended to produce workmanship of a higher quality than did the group audio-visually instructed.

3. The investigator concluded that the series of the slides with instruction was not sound.

A study was conducted by Hofer (1964) to ascertain the relative effectiveness of self-instructional materials consisting of photographs, printed instructions in booklet form, and demonstrations in teaching industrial arts manipulative operations. It was found that:

1. No statistically significant differences were found in the two methods of presenting instruction with respect to amount of terminology and knowledge of precedure learned and retained, as ascertained by tests given immediately after performance and one week later.
2. Sixty-nine percent more individual assistance was required during performance when instruction was presented by demonstrations than when presented by self-instructional materials.
3. With respect to the quality of work completed, no statistically significant difference between the two methods was found.
4. Approximately seven percent more time was required per student to receive instruction and perform the operation when instruction was presented by self-instructional materials.

Dutton (1965) determined the feasibility of using television for instructional purposes in industrial arts education. Findings were as follows:

1. Television in industrial arts education was being used and was feasible.
2. Some instructional areas relate themselves to television better than did others.
3. Teaching techniques could be enhanced to an operational advantage by use of television.
4. The single-room concept of television usage appeared to be the simplest and least expensive.
5. Critical factors related to conversion to television instruction in industrial arts education were as follows: a) level and objective of the program, b) in-service training program for staff,

c) selection of subject matter, d) selection of personnel and e) method of evaluation.

Piersall (1965) presented a study with four purposes:

1. To determine which of three instructional methods would yield the most efficient learning based upon a pretest and post-test.
2. To determine the effectiveness of the methods utilized when the students were divided into three groups (upper, inter, and lower quartiles) as determined by their pretest scores.
3. To determine which of the methods tested would yield the greatest amount of retention of the material studied four and seven weeks after instruction occurred.
4. To make recommendations based on the findings of item one through three above, regarding methods of teaching a nonmanipulative technical unit of factual information to a college freshman class. Three methods were tested: a) the traditional chalk-board lecture presentation, b) dispensation of information sheets without a formal presentation and c) a lecture presentation supplemented by closed circuit television.

Results indicated that:

1. Only two comparisons produced results that were statistically significant. These were in the four-week retention tests. The comparison of the inter-quartile of methods A and B distinctly favored A. The comparison of the lower quartiles of A and C at this level favored C.
2. On the seven-week retention test, the advantage described above disappeared.
3. Some of the investigator's conclusions were that as far as the net learning was concerned, the three methods were equally effective. Based on the least amount of classroom time, method B was considered to be the most efficient.

A study was made by Brooks (1965) to ascertain the effectiveness of overhead transparencies on learning and retention of selected materials in beginning woodwork. The following conclusions were drawn:

1. The statistical analysis in the investigation supported the hypothesis that achievement of students in selected units of woodworking was significantly greater when special overhead transparencies were used to supplement conventional methods of instruction.
2. Overall retention of selected units by the experimental groups was significantly greater than was that of the control groups.
3. The lower intelligence level groups of the experimental stations achieved on the average only .3 lower mean raw scores than the upper intelligence level groups of the control sections.
4. Certain teachers and specific intelligence levels had highly significant effects upon student achievement; teachers favored overhead transparencies because of increased student interest, logical presentation of materials, reduced lecture time and favorable review techniques.
5. Transparencies readily enable concrete principals of instruction to be presented and improve the professional presentations.

A similar study by Cosby (1966) to determine the capability of the overhead projector as a visualizing device to replace the use of the blackboard in technical classrooms and laboratories was made in Rochester Technical High School. Results indicated that motivation was increased and that creative impulses of the students were aroused. Each topic was considered in much greater depth and, with the time saved, several important new topics were added.

A study was made by Snyder (1961) to determine the effectiveness of teacher-produced instructional films for use in industrial arts education. The control group was given demonstrations, whereas the same subject matter was presented to the experimental group by the teacher-produced instructional films. Both groups constructed projects that required the use of the perceptual-motor skills which were presented. The completed projects were evaluated by a jury of industrial arts educators. It was found that students in the experimental group did not differ from the control group in their performance of the specific perceptual-motor skill.

LeMaster (1962) studied the use of filmed demonstrations with manual class demonstrations versus conventional demonstrations in introductory woodwork. In the teaching of introductory woodworking to boys on the junior high school level, the competencies rated were: a) mastery of related technical knowledge, b) ability of the students to perform manipulative skills and c) number of manual demonstrations (small-group and individual) performed by the class instructor.

The study revealed significant and important advantages in favor of the filmed demonstrations used to introduce the manual demonstration. In mastery of related technical knowledge, the experimental classes consistently showed larger increments in learning.

A study was conducted by Shell (1965) to determine the effectiveness of the use of the Diatype as an instructional device in developing speed and accuracy in first-year typewriting. Findings were as follows:

1. Use of the Diatype was found to be an effective means of developing greater speed in the first-year typing class.
2. Use of the Diatype as a means of developing greater accuracy was not established.
3. The Diatype can be used as an effective device for diagnosing common irregularities, such as difficult letter combinations, awkward reaction to punctuation markings, slowness in operating the space bar, and erratic rhythm.

Teaching Machines and Programmed Instruction

Around 1960, DuPont used its first programmed instruction course, "Reading Engineering Drawings," with a group of mechanics trainees. Altmaier (1965) compared a group receiving programmed instruction to a group receiving conventional instruction. The former group completed the course in 25 percent less time and, on the average, obtained scores 13 percent higher on the course examination. As a result of the success of the programmed instruction, DuPont made a $2 million investment in this procedure. The cost of developing a programmed instruction course was $2,000 per course-hour of instruction. More than 10,000 DuPont employees have completed an average of three courses.

The following advantages to programmed instruction were listed:

1. The students uniformly learn more.
2. This type of learning was transmitted to job performance.
3. No instructor was necessary.
4. Training time could be reduced.
5. Uniform, high quality instruction was provided.
6. Programmed instruction approaches private tutoring.

The Timken Roller Bearing Company used a programmed instruction course on tool grinding with 57 apprentices (Anonymous, 1965a). The apprentice who completed the course in the shortest time finished the course in 8½ hours; the slowest time was 23 hours; and the average time for the group was 16 hours. The average score on the final test was 86. Timken believed the advantages of programmed instruction to be:

1. Allowed the student to proceed at this own speed.
2. Freed the teacher from routine.
3. Permitted the apprentice to think for himself.

A study was made by Grubb (1965) to determine whether or not the measured vocational values of a group of eleventh and twelfth grade students who had used Values and Choices -- a programmed textbook -- were significantly different from a comparable control group who had not.

It was concluded that:

1. Eleventh and twelfth grade students who used the programmed textbook valued the self-realization aspect of work more than did those who did not use Values and Choices.

2. An interaction existed between sex and grade levels with respect to the value of job freedom. The job freedom values held by the twelfth grade males and females were more divergent than were the job freedom values of eleventh grade males and females.

Neidt and Meredith (1966) conducted a study to determine the nature of changes in student attitudes when programmed instruction was interpolated between conventional instruction experiences. Students' attitudes were significantly more favorable toward the programmed unit. Changes were considerably more pronounced for the 17 highest ability students. The investigators suggested that the instructor should give special attention to student attitudes during the transition from programmed instruction to conventional instruction.

An attempt was made by Aguirre (1966) to determine the effectiveness of two modes of teaching engine lathe work. Results showed:

1. No significant difference between two student groups in their achievement of engine lathe principles and procedures when taught by lecture-demonstration and programmed instruction-demonstration.

2. No significant difference between two student groups in their proficiency of engine lathe operation when taught by the above methods.

3. No significant difference between two student groups in their retention of engine lathe principles and procedures when taught by illustrative lecture-demonstration and programmed instruction-demonstration methods.

A study by Blain (1961) investigated the practicability of teaching certain procedural skills to adult foreign students by means of self-instructional programs. Conclusions were:

1. Perceptual-motor skills related to the operation of certain types of photographic equipment could be taught individually to adult foreign students by means of a self-instructional, demonstration-practice-test type of program.

2. Necessary verbal cues could probably be presented as effectively in caption form as with a recorded commentary.

Mayo and Longo (1966) tested the hypothesis that training time, without loss of quality, could be reduced by means of programmed instruction. Subjects were 226 U. S. Navy and Marine Corps electronics trainees. The programmed instruction group achieved a 31 percent time saving mark, and scored significantly higher on post-instruction testing than the control group. The hypothesis was considered to be upheld.

A study was made by Froehlich (1965) to determine the relative effectiveness of linear and non-linear programs in the teaching of electronics. Findings were:

1. Linear (Skinner-type) programs were best for students whose prior achievement scores were low; the lecture proved best for students whose prior achievement scores were high.

2. Neither form of programmed instruction, nor the lecture, permitted the high ability students to reach the academic level usally attained by non-remedial students.

3. The average student, using either form of programmed instruction, completed remedial training better than, those in lecture, and 30 percent sooner.

Weffenstette (1966) conducted a study to determine whether, or not, laboratory experiences make a significant contribution to the learning of basic electronics when a programmed instructional system is employed. The control group received laboratory experience, six hours per week, but the experimental group did not. Both groups received the same programmed material and common lecture. Findings were as follows:

1. There were no significant statistical differences between methods, groups, or previous industrial arts instruction when compared with the criterion measure for gain and retention.
2. There were some differences in group performance on three of the nine tests.
3. The amount of correlation between criterion gain scores and personality traits was insignificant.

A study was made by Henson (1964) to determine the effectiveness of Gregg shorthand theory presented at the high school level. Two nearly equal groups were created: the experimental group used programmed material exclusively, while the control group was taught in the conventional way. The experimental group completed their assignments a week earlier than did the control group. Their mean vocabulary scores were significantly greater than those of the control group. The mean transcription scores of the experimental group were significantly greater than those of the control group on four of five tests.

An experimental study of programmed shorthand homework was made by Walters (1964). Findings showed that:

1. Programmed materials aided the students.
2. Students who had studied shorthand in high school for one year seemed to be aided more by the materials than did those who had previously received two years of instruction.
3. Through programmed materials, new vocabulary may be effectively presented and learned at home.

The primary purpose of a study by Pinkerton (1963) was to determine the feasibility of using programmed instruction in teaching business communications to 250 junior students in the College of Business Administration, University of Arkansas. Findings were as follows:

1. No significant difference existed between mean of classes in mental ability, nor in the subject matter, as revealed by a pretest.

2. The classes using programmed instruction achieved significantly (p = .01) higher test scores than the classes in the control group.

3. Classes using the programmed test-lecture-discussion combination achieved test scores significantly (p = .05) higher than did classes using only the program text in class and regular text outside class combinations.

4. Different instructors produced significantly (p = .01) different class results even when programmed instruction was used.

5. In classes not using programmed instruction, the classes of different instructors achieved results which were significantly (p = .01) different.

6. The programmed class of each instructor achieved significantly (p = .01) higher test scores than his control class. The programmed classes had scores higher than did the control classes.

7. Generally, the students were favorably disposed toward programmed instruction.

8. All things considered, the instructors favored programmed instruction.

A study was made by Beck (1965) to determine the principles, effects and possibilities of programmed instruction when applied to iconic methods used in drafting. Findings indicated that:

1. Differences in performance favored the group using the program and apparatus in terms of grades on the criterion test, judgement of greater manipulation skill, and on time required to complete the material.

2. The experimental group (Hawthorne effect) had a highly favorable attitude towards the apparatus and the programmed material.

2

General Curriculum

Yeo (1965) conducted a study to determine whether or not theorists' assumptions about the manner a curriculum is developed, without research, differ from one developed with research. It was found that:

1. The hypothesis, assuming that anything less than 88 percent agreement between the real and the theoretical curricula would be disconcerting to community college officials, was upheld.

2. A 20 percent discrepancy existed between the judgments of college officials and educational theorists.

3. Theorists were correct in saying that junior colleges, proclaiming fulfillment of community need as a curricular goal were not always able to achieve that goal and, in some cases, did not openly recognize the failure.

A study was made by Bessire (1966) to determine the extent the vocational training program at Shasta College, Redding, California has been responsive to the apparent occupational training needs of its community and to certain expressed vocational interests of its students. It was found that a majority of the former students had found employment directly related to their training, and were living within the college service area. The overall conclusion of the study was that the college, concerned about satisfying the training demand of its community and the interests of its students, had provided certain programs for this purpose. In general, these programs were successful in training students for employment. Evidence suggested that the college could improve its communications with large industries and its curriculum development procedures. A principal recommendation of the investigator was that additional administrative leadership be provided to insure a more systematic approach to curriculum development, and to maintain a closer relationship with employers in the community.

Acosta (1965) conducted a study to determine steps necessary to improve vocational education in San Joaquin County.

Findings and recommendations included the following:

1. Existing high school and junior high school curricula should be modified to provide more prevocational and vocational training for students not expecting to complete a bacculaureate program.

2. Vocational programs should be directed toward the potential drop-out.

3. Vocational training offerings should be expanded.

4. Employer needs and curricular offerings should be matched.

5. Vocational education offerings and aspirations within the county should be coordinated.

Parrish (1965) made a study of the personal and educational characteristics of all the apprentices enrolled, for a minimum of 144 hours per year, in the related instruction classes of Nebraska public schools. Findings were as follows:

1. A majority of the apprentices had been enrolled in the industrial education courses of the secondary school.

2. A broad base program of industrial education developed for a cluster of occupations, was deemed desirable by the apprentices, rather than courses which were representative of single skill occupations.

3. A majority of the apprentices placed more importance in secondary school mathematics, as a basis for apprenticeship, than for industrial education.

4. A majority of the apprentices were not informed about apprenticeship through the secondary school.

5. Data had been presented concerning the investigation of the hypothesis that a majority of apprentices had a family occupational tradition within the trade to which indentured.

6. A majority of the apprentices were in their twenties, married and had children. The evidence presented in the investigation of the hypothesis was in harmony with the principles of apprenticeship selection.

7. The evidence supported the hypothesis that a majority of the apprentices were not recipients of credit for apprenticeship time based on the secondary school program. It was noted that no special time credit for the secondary school program was considered for apprenticeship.

An evaluation of retraining and vocational education programs was made by Somers in 1965. It was found that:

1. Many employers who approved the federal program were not opposed to one-the-job training itself; they considered their area traditionally in favor of private initiative.

2. A somewhat larger group of employers preferred government-aided institutional training as compared to those who preferred subsidized on-the-job training.

3. The preference for government-subsidized on-the-job training increased with the size of the responding firm.

4. Employers listed the following advantages to on-the-job training: a) greater company control over the training, b) training for specific company jobs, and c) immediate job placement.

McNamara (1963) conducted an exploratory study designed to determine the feasibility of retraining employees whose services have been made surplus or technologically obsolete indicated that, if necessary, many of the employees previously not considered eligible could be retrained for a relatively high-level technician's job. It was found that learning ability did not present a major obstacle, but that the educational background of the employees, and particularly their lack of knowledge of mathematics and technical subjects, was a definite limiting factor. Employee acceptance of the opportunity to enroll in the retraining program seemed to be influenced by their interest in the work, confidence in their ability to succeed, and the climate created by management. Finally, the number of employees in this situation considered not suitable for any type of retraining was estimated to be very small provided the training time, when necessary, was increased with a resulting increase in cost per trained employee.

Information was obtained by Chiantelli (1965) from 75 students and employers who participated in the work experience and work study programs of Shasta College. Both student and employer believed the programs to be valuable. The programs increased the student's marketable skills, helped bridge the gap between classroom and actual job situations, and provided financial assistance to permit students to continue their education. Some suggestions arising from the study were that students improve typing accuracy and penmanship, and that they should be provided experience on bookkeeping machines and cash register equipment at the college.

A study was made by Braden (1964) to determine what effect vocational office training had on career patterns of former students. Findings were as follows:

1. Four distinct career patterns emerged:
    - (a) stable -- enters and experiences upward mobility
    - (b) dead-end -- enters and remains at one level or experiences downward mobility
    - (c) unstable -- enters and holds several jobs at about the same skill level, then leaves for other employment
    - (d) temporary -- enters at low level and leaves the labor market after short time (less than one year and remains off labor market for six years)
2. Those with more vocational office training felt prepared for work, obtained high level entering and ending jobs, and were identified as having experienced stable beginning career patterns.

A study was conducted by Robertson (1965) to appraise the effectiveness of a secondary school cooperative education program. It was found that:

1. Cooperative education did not appear to have any effect on satisfaction, performance, supervisory responsibilities, salary earned, stability, and aspirations.
2. The work phase of cooperative education was not considered, by this group, to be primarily a learning experience.

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